What is claimed is:

1. A method of joining a connection member to a foil, the method comprising:

positioning the connection member and the foil against each other; and

forcing the connection member and the foil together between a hardened surface and a staking pin which has a tip of less than or equal to approximately 0.030" (0.762 mm) in diameter.

2. The method of claim 1, wherein forcing the connection member and the foil together comprises striking the foil with the staking pin and forcing the foil into the connection member.

3. The method of claim 1, wherein the staking pin has a frusto-conical shape approximately 0.015" (0.381 mm) at its tip.

4. The method of claim 1, further comprising providing a second staking pin, wherein the two staking pins are approximately 0.040" (1.016 mm) apart.

5. The method of claim 1, further comprising:

positioning the staking pin to a terminal height of approximately 0.001" (0.0254 mm) above the hardened surface;

positioning the staking pin to strike at approximately 0.120" (3.048 mm) from an edge of the foil.

6. The method of claim 1, wherein forcing the connection member and the foil together comprises forcing the connection member and the foil together at a force between 100 and 1000 pounds.

7. The method of claim 1, wherein the foil comprises an etched anode foil.

8. The method of claim 1, wherein the foil comprises an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

9. A method of joining a connection member to a foil, the method comprising:
placing the connection member against a hardened surface;
placing the foil between the connection member and a staking tool; and
forcing the foil into the connection member with the staking tool.

10. The method of claim 9, further comprising positioning the staking tool to a terminal height of about 0.001" (0.0254 mm) above the hardened surface before forcing the foil into the connection member with the staking tool.

11. The method of claim 9, wherein forcing the foil into the connection member with the staking tool comprises using a force of between 100 and 1000 pounds.

12. The method of claim 9, wherein the staking tool comprises two staking pins approximately 0.040" (1.016 mm) apart, each staking pin comprising a frusto-conical shape approximately 0.015" (0.381 mm) at its tip and approximately 0.028" (0.7112 mm) at its base.

13. A capacitor comprising:
an anode;
a cathode;
a separator between the anode and the cathode; and

a connection member attached to the anode by a stake weld joint having a diameter of less than or equal to approximately 0.030" (0.762 mm).

14. The capacitor of claim 13, wherein the stake weld joint has a diameter of approximately 0.010" (0.254 mm) to approximately 0.020" (0.508 mm).

15. The capacitor of claim 13, wherein the stake weld joint has a diameter of approximately 0.015" (0.381 mm).

16. A capacitor comprising:

a first anode having an edge face;

a cathode;

a separator between the first anode and the cathode; and

a connection member attached to the first anode, the connection member having a first section extending over and confronting the edge face of the first anode.

17. The capacitor of claim 16, further comprising a second anode attached to the first anode, the second anode having a notch, the connection member having a second section fitting within the notch and attached to the first section.

18. The capacitor of claim 16, wherein the connection member comprises a main member having a generally L-shaped cross-section.

19. The capacitor of claim 16, wherein the first section is approximately 0.004" (0.1016 mm) thick and the second section is approximately 0.014" (0.3556 mm) thick.

20. The capacitor of claim 16, further comprising a second anode attached to the first anode, the connection member not directly attached to the second anode.

21. The capacitor of claim 16, wherein the first anode comprises an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

22. A capacitor comprising:

a first anode having a major surface having an edge face;

a cathode;

a separator between the anode and the cathode; and

a connection member having a surface abutting the major surface of the first anode and an edge face approximately flush with the edge face of the first anode.

23. The capacitor of claim 22, further comprising a second anode having a major surface having an edge face and a second connection member having a surface abutting the major surface of the second anode, the second connection member having an edge face approximately flush with the edge face of the second anode, wherein the first connection member edge face and the second connection member edge face are substantially co-planar.

24. The capacitor of claim 22, wherein the first connection member edge face is edge-connected to the second connection member edge face.

25. A capacitor comprising:

a first multi-anode stack including a top anode having a notch and a bottom anode having a notch and one or more middle anodes not having notches;

a second multi-anode stack including a top anode having a notch and a bottom anode having a notch and one or more middle anodes not having notches, the second multi-anode stack located below the first multi-anode stack;

wherein, the capacitor has a major notch which comprises the bottom anode notch of the first multi-anode stack and the top anode notch of the second multi-anode stack;

a connection member located within the major notch, the connection member having a back face abutting an edge face of the top anode of the second multi-anode stack and an edge face of the bottom anode of the first multi-anode stack, the connection member having a top face abutting a major surface of one of the one or more middle anodes of the first multi-anode stack and a bottom face abutting a major surface of one of the one or more middle anodes of the second multi-anode stack, the connection member having a front face substantially flush with an edge face of the one or more middle anodes of the first multi-anode stack and with an edge face of the one or more middle anodes of the second multi-anode stack.

26. The capacitor of claim 25, wherein the connection member is not directly attached to either the top or the bottom anode of the first multi-anode stack or the top or the bottom anode of the second multi-anode stack.

27. The capacitor of claim 25, wherein one or more of the top, bottom, or middle anodes of the first or the second multi-anode stack comprises an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

28. A capacitor comprising:

a multi-anode stack including a top anode having a notch, a bottom anode having a notch, and one or more middle anodes not having notches; and

a U-shaped connection member having an inner surface, the inner surface including a first section abutting a major top surface of one of the one or more middle anodes, a second section abutting a major bottom surface of one of the one or more middle anodes, and a third section confronting an edge face or faces of the one or more middle anodes, the U-shaped connection member having a first edge face abutting an edge face of the top anode and a second edge face abutting an edge face of the bottom anode.

29. The capacitor of claim 28, wherein one or more of the top, bottom, or middle anodes of the multi-anode stack comprises an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

30. A flat capacitor comprising:

one or more capacitor elements, each capacitor element comprising;

an anode having a connection member attached thereto;

a cathode; and

a separator located between the anode and the cathode;

wherein, each connection member has a surface substantially flush with a surface of a connection member or connection members adjacent to each other anode connection member, and wherein each connection member is attached to the connection member or connection members adjacent to each connection member at an edge-connection between the connection members at their substantially flush surfaces.

31. The flat capacitor of claim 30, wherein the edge-connection comprises a laser edge-weld.

32. The flat capacitor of claim 31, wherein the laser edge-weld comprises a pulse width approximately in the range from 1.0 ms to 2.5 ms and an energy level approximately in the range from 0.8 J to 2.0 J.

33. The flat capacitor of claim 30, wherein the edge-connection comprises a seam edge-weld.

34. The flat capacitor of claim 30, wherein the edge-connection comprises a wire spot weld.

35. The flat capacitor of claim 30, wherein the edge-connection comprises a cross-wise edge-weld.

36. A method of coupling a plurality of anode connection members of a capacitor, the method comprising:

attaching an anode connection member to two or more of a plurality of anodes;

positioning each of the anode connection members so that each anode connection member is flush with each other anode connection member or connection members adjacent to each anode connection member; and

edge-connecting each anode connection member to the anode connection member or connection members adjacent to each anode connection member.

37. The method of claim 36, wherein edge-connecting comprises laser welding along a seam between each of the anode connection members.

38. The method of claim 36, wherein each of the plurality of connection members having a cut-out adapted to matably fit within a notch on an anode.

39. A method of joining two or more foils, the method comprising:

positioning the two or more foils in a stack; and

forcing the two or more foils together between a hardened surface and a staking pin which has a tip of less than approximately 0.060" (1.524 mm) in diameter.

40. The method of claim 39, wherein the staking pin has a tip of approximately 0.025" (0.635 mm) in diameter.

41. The method of claim 39, further comprising setting the staking pin to a displacement height of approximately 0.001" (0.0254 mm) above the hardened surface.

42. The method of claim 39, wherein forcing the two or more foils together comprises forcing the two or more foils together at a force of approximately 100 to approximately 1000 pounds.

43. The method of claim 39, wherein forcing the two or more foils together comprises forcing at least one foil comprising an etched anode foil together with one or more other anode foils.

44. The method of claim 39, wherein forcing the two or more foils together comprises forcing three anode foils together, each anode foil comprising an etched foil.

45. The method of claim 39, wherein positioning the foils comprises stacking three etched anode foils in a dimension perpendicular to a major surface of each of the anode foils.

46. The method of claim 39, wherein the two or more foils comprise two or more anode foils, each anode foil approximately 0.004" (0.1016 mm) thick.

47. A system for joining two or more anode foils, the system comprising:

a hardened surface for stacking the two or more foils thereon;

a staking pin having a tip diameter of less than approximately 0.060" (1.524 mm); and

means for forcing the staking pin towards the hardened surface.

48. The system of claim 47, wherein the staking pin has a tip diameter of approximately 0.025" (0.635 mm).

49. A method of assembling an anode stack, the method comprising:

staking a tab to only a first anode foil by a first stake weld; and

staking the first anode foil to a second anode foil by a second stake weld.

50. The method of claim 49, wherein staking the first anode foil to the second anode foil comprises staking the first anode foil to at least two anode foils by the second stake weld.

51. The method of claim 49, wherein staking the first anode foil to the second anode foil comprises staking a first anode foil having a tunnel-etched region to a second anode foil having a tunnel-etched region.

52. A method of assembling a capacitor, the method comprising:

assembling two or more anode stacks by a method comprising:

staking a connection member to only a first anode foil by a first stake weld; and

staking the first anode foil to a second anode foil by a second stake weld;

stacking the two or more anode stacks into a capacitor stack; and

welding each anode stack connection member to each other adjacent anode stack connection member.

53. The method of claim 52, wherein staking the first anode foil to the second anode foil comprises forcing the first anode foil together with the second anode foil with a staking pin having a tip diameter less than approximately 0.060" (1.524 mm).

54. The method of claim 52, wherein the first anode foil and the second anode foil each comprise an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

55. The method of claim 52, wherein welding each anode stack connection member to each other adjacent anode stack connection member comprises edge-welding the connection members together.

56. A flat capacitor comprising:

a multi-anode stack including two or more anode foils;

a cathode; and

a separator located between the anode stack and the cathode;

wherein, each anode foil of the multi-anode stack is connected to the other foils of the multi-anode stack by a stake weld joint having a diameter less than approximately 0.060" (1.524 mm).

57. The flat capacitor of claim 56, wherein the stake weld has a diameter of approximately 0.025" (0.635 mm).

58. The flat capacitor of claim 56, further comprising a second multi-anode stack including two or more anode foils, wherein each anode foil of the second multi-anode stack is connected to the other foils of the second multi-anode stack by a stake weld joint having a diameter less than approximately 0.060" (1.524 mm), and wherein the stake weld joint of the first anode stack is in a different location relative to a major surface of the first anode stack than the stake weld joint of the second anode stack.

59. A capacitor comprising:

a capacitor case having an electrolyte therein;

an anode foil having a porous structure located within the capacitor case and having a formation voltage of approximately 441 volts or greater.

60. The capacitor of claim 59, wherein the anode foil comprises an aluminum foil having a formation voltage of greater than approximately 600 volts.

61. The capacitor of claim 59, wherein the anode foil comprises an aluminum foil having a formation voltage between approximately 441 volts and approximately 600 volts.

62. The capacitor of claim 59, wherein the anode foil comprises an aluminum foil having a formation voltage of approximately 600 volts.

63. The capacitor of claim 59, wherein the anode foil comprises an aluminum foil having a formation voltage of approximately 600 volts to approximately 800 volts.

64. The capacitor of claim 59, wherein the anode foil is etched.

65. The capacitor of claim 59, wherein the capacitor case is a flat capacitor case dimensioned to fit within an implantable medical device.

66. The capacitor of claim 59, wherein the anode foil comprises a multi-anode comprising at least two porous anode foils and wherein each anode foil comprises a foil having a formation voltage of approximately 600 volts or greater.

67. The capacitor of claim 66, wherein at least one of the at least two porous foils is a tunnel etched foil.

68. The capacitor of claim 66, wherein at least one of the at least two porous foils includes one or more perforations.

69. The capacitor of claim 59, wherein the capacitor comprises a flat capacitor.

70. A method of preparing an anode for a capacitor, the method comprising:

etching an anode foil; and

forming a dielectric layer on the anode foil at a formation voltage between approximately 441 volts and approximately 800 volts.

71. The method of claim 70, wherein etching comprises tunnel etching.

72. The method of claim 70, wherein etching includes forming one or more perforations in the anode foil.

73. The method of claim 70, wherein forming the dielectric layer on the anode foil comprises forming the dielectric layer on the anode foil at a formation voltage between approximately 441 volts and approximately 600 volts.

74. The method of claim 70, wherein forming the dielectric layer on the anode foil comprises forming the dielectric layer on the anode foil at a formation voltage between approximately 600 volts and approximately 800 volts.

75. An implantable medical device comprising:

one or more leads for sensing electrical signals of a patient or for applying electrical energy to the patient;

a monitoring circuit for monitoring heart activity of the patient through one or more of the leads; and

a therapy circuit for delivering electrical energy through one or more of the leads to a heart of the patient, wherein the therapy circuit includes a capacitor, the capacitor comprising:

a plurality of anodes, each anode comprising an anode foil having a formation voltage of approximately 441 volts or greater and having a porous structure;

a plurality of cathodes; and

a plurality of electrolyte impregnated separators, at least one of the plurality of electrolyte impregnated separators located between each anode and each cathode.

76. The implantable medical device of claim 75, wherein the anode foil has a formation voltage of approximately 600 volts or higher.

77. The implantable medical device of claim 75, wherein the therapy circuit includes a single capacitor.

78. An implantable medical device comprising:

one or more leads for sensing electrical signals of a patient or for applying electrical energy to the patient;

a monitoring circuit for monitoring heart activity of the patient through one or more of the leads; and

a therapy circuit for delivering electrical energy through one or more of the leads to a heart of the patient, wherein the therapy circuit includes one or more capacitors, each capacitor comprising:

a multi-anode stack comprising two or more anode foils;

a cathode; and

a separator located between the anode stack and the cathode;

wherein, each anode foil of the multi-anode stack is interconnected to the other foils of the multi-anode stack at a stake weld joint having a diameter of less than approximately 0.060" (1.524 mm).

79. The implantable medical device of claim 78, wherein the stake weld has a diameter of approximately 0.025" (0.635 mm).

80. The implantable medical device of claim 78, wherein each of the two or more anode foils comprises a tunnel-etched foil.

81. The implantable medical device of claim 78, wherein each of the two or more anode foils comprise an anode foil having a porous structure and a formation voltage of greater than approximately 441 volts.

82. An implantable medical device comprising:

one or more leads for sensing electrical signals of a patient or for applying electrical energy to the patient;

a monitoring circuit for monitoring heart activity of the patient through one or more of the leads; and

a therapy circuit for delivering electrical energy through one or more of the leads to a heart of the patient, wherein the therapy circuit includes one or more capacitors, each capacitor comprising:

a plurality of anodes, each anode having an edge surface;

a plurality of connection members, each of the plurality of connection members attached to one of the plurality of anodes, each connection member comprising a member having a surface confronting the edge surface of at least one anode;

a plurality of cathodes; and

a plurality of electrolyte impregnated separators, at least one of the plurality of electrolyte impregnated separators located between each anode and each cathode.

83. The heart monitor of claim 82, wherein each anode connection member is connected to each other anode connection member adjacent to each anode connection member by an edge-connection.

84. The heart monitor of claim 82, wherein each anode connection member is connected to each anode by a micro-stake weld.